

## CLAIMS

What is claimed is:

1. An antenna comprising:  
a dielectric cavity within a semiconductor substrate having walls defined by a plurality of vias through the substrate;  
a gas cavity external to the substrate aligned with the dielectric cavity; and  
a conductive feed disposed on the substrate across the cavities.
2. The antenna of claim 1 wherein a ground plane side of the substrate is devoid of ground plane conductive material substantially between the walls of the dielectric cavity.
3. The antenna of claim 2 wherein the antenna is a slot antenna, and  
wherein the feed comprises a microstrip feed line disposed on the substrate across a slot over the cavities, and  
wherein the slot comprises a rectangular region without conductive material on a circuit side of the substrate over the dielectric cavity.
4. The antenna of claim 3 wherein the microstrip feed line is disposed on the ground plane side of the substrate across the slot.
5. The antenna of claim 1 wherein the antenna is a dipole antenna further comprising:  
a first pole comprising conductive material on a ground plane side of the substrate disposed over the cavities; and  
a second pole comprising conductive material on a circuit side of the substrate disposed over the cavities,  
wherein the plurality of vias and one of the poles are electrically coupled to a ground, and  
wherein the other of the poles is coupled with the conductive feed.